Dokl.Akad.Nauk, 110, fasc.5, 769-771 (1956)   CARD   2 / 2   PA - 1703

stants with α are modified on the occasion of transition from the compounds of one metal to those of another. In some cases the coefficients k are so little distinguished from one another that they may be assumed to be identical. In a second table comparison between the mechanical and electric properties and α is continued. If α increases, the hardness of the crystals grows, but dielectric losses (tg δ at 10^6 c) and the pressure of flowing out diminish. In the case of an increase of α a tendency towards a reduction of the shearing modulus and of the YOUNG modulus is found. The author controlled the values of the YOUNG modulus and of the shearing modulus on some salts.

A third table compares the properties of the oxides of the second group with the amount of α. With increasing α the sublimation heat, the melting temperature, the lattice energy, and hardness increase, but thermal capacity as well as entropy diminish. Also hydration heat is reduced with growing α. The dependence of some properties on α is noticed also in the case of liquid organic dielectrica. The electric resistivity of a homologous series of liquid dielectrica diminishes with increasing α. In solid dielectrica electric resistivity increases with increasing α. For this and other reasons α may be looked upon as a totality of many properties of matter.

INSTITUTION: Polytechnical Institute "S.M.KIROV" at Tomsk.

SOV/137-58-11-23251

Translation from: Referativnyy zhurnal. Metallurgiya. 1958, Nr 11, p 201 (USSR)

AUTHORS: Savintsev, P. A. , Avericheva, V. Ye.

TITLE: Contact Melting of Crystals (Kontaktnoye plavleniye kristallov)

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Fizika, 1957, Nr 1, pp 162-166

ABSTRACT: Bibliographic entry

Card 1/1

AUTHORS: Savintsev, P. A., Avericheva, V. Ye.

TITLE: The Contact Fusion of Crystals (O kontaktnom plavlenii kristallov)

ABSTRACT: A description is presented of the phenomenon of contact fusion of
crystals forming a eutectic. The phenomenon is explained by the
fact that the reaction between homogeneous atoms predominates in
the solid state, while that between heterogeneous ones is dominant
in the liquid. The temperature of contact fusion, t, is the tempera-
ture at which a transition occurs from the one type of reaction among
the particles to the other. Contact fusion is also observed in the case
of components forming solid solutions. The appearance of a liquid
phase occurred in this case at tens or hundreds of degrees below the
temperature of fusion of the individual crystals. Prior diffusion at
a temperature lower than t does not influence contact fusion.
D. B.

Card 1/1

57-6-16/36

AUTHOR: SAVINTSEV, P.A.
TITLE: Physical Properties of Alloys and Molecular Concentration.
             (Fizicheskiye svoystva splavov i molekulyarnaya kontsentratsiya,
             Russian).
PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 6, pp 1257 - 1260 (U.S.S.R.)

ABSTRACT: Tables are shown from which the following can be seen: From table 1
             we see that an increase of Δc on the occasion of an increase of
             $\alpha_1 + \alpha_2$ was observed in the case of all admixtures except those
             with an ordinary cubical-lattice. $\frac{\Delta g}{c}$ characterizes the change of
             the electric resistance of gold, silver and copper which is caused
             by one atom per cent of the admixture. α_1 is the molecular con-
             centration of the basic component, α_2 that of the added substance.
             From table 2 we see that the heat Q (in the case of the formation
             of solid substances Q is absorbed) decreases with the increase of
             $\alpha_1 + \alpha_2$. From table 3 we see that the coefficient of linear ex-
             tension a of the copper- and gold alloys decreases with an in-
             crease of $\alpha_1 + \alpha_2$. From table 4 we can see that with an increase
             of $\alpha_1 + \alpha_2$ the melting temperature of double eutectics as well
             as the minimum melting temperature of solid substances are raised.

Card 1/2

57-6-16/36

Physical Properties of Alloys and Molecular Concentration.

From table 5 we see that the melting temperature of the triple eutectics rises if α_3 of the third component is increased. Table 6 shows the relation between $\alpha_1 + \alpha_2$ and the temperature T of the transition of eutectic copper alloys to a super-conductive state. Table 7 compares the temperature coefficients of hardness according to BRINELL β of the double and triple eutectic alloys with $(\alpha_1 + \alpha_2)$ and α_3. If the molecular concentration α increases, the absolute value of β decreases. Table 8 shows the relation between the change of the surface-tension coefficient $\Delta\sigma$ of the alloy Li_2SO_4 and α_2. Thus, α is the quantity which characterizes many properties of the alloys. (With 1 illustration, 8 tables, and 7 Slavic references).

ASSOCIATION: Polytechnic Institute Tomsk. (Politekhnicheskiy institut,Tomsk, Russian)

PRESENTED BY:

SUBMITTED: 14.12.1956

AVAILABLE: Library of Congress

Card 2/2

SAVINTSEV, P. A.,

P. A. Savintsev and others (TPI)

"The strength of alkali-halide solutions determined according to the method of boring and mutual grinding increases with increasing molecular concentration its change according to its composition following a curve with a minimum"

Report presented at a Conference on Solid Dielectrics and Semiconductors, Tomsk Polytechnical Inst., 3-8 Feb. 58. (Elektrichestvo, '58, No. 7, 83-86)

SAVINTSEV P. A

VOROBYEV, A. A. and SAVINSEV, P. A.

"Mechanical Properties of Ionic Crystals,"

paper presented at the Conf. on Mechanical Properties of Non-Metallic Solids, Leningrad, USSR, 19-26 May 58.

Polytechnical Institute, Tomsk.

SOV/58-59-5-10837

Translation from: Referativnyy Zhurnal Fizika, 1959, Nr 5, p 133 (USSR)

AUTHOR: Savintsev, P.A.

TITLE: On the Physical Properties of Ionic Crystals

PERIODICAL: V sb.: Fiz. dielektrikov. Moscow, AS USSR, 1958, pp 113 - 117

ABSTRACT: The author advances the hypothesis that the molecular concentration $\alpha = D/M \times 10^3$, where D is the density and M is the molecular weight, may characterize many properties of crystals and alloys. Proceeding from this, he considers the connection between α and the following properties: the electric resistance for alkali halide crystals, both pure and with impurities, and for the homologous series of liquid organic compounds; dielectric losses in alkali halide salts; the constant which forms a part of the exponent of the expression of the van't Hoff type for ionic electric conductivity; Mohs hardness for alkali halide crystals and compounds of the elements of the 2nd group

Card 1/2

On the Physical Properties of Ionic Crystals   SOV/58-59-5-10837

of the periodic system; the melting and sublimation heats, the coefficient of
linear expansion, and the heat of formation for alkali halide crystals. (Politekhn.
in-t, Tomsk).

V.V. Krasnopevtsev

Card 2/2

SOV/139-58-4-14/30

AUTHORS: Savintsev, P.A., Zlenko, V. Ya, and Naumov, A.F.

TITLE: On the Hardness of Ionic Alloys (O tverdosti ionnykh splavov)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, 1958, Nr 4, pp 86-90 (USSR)

ABSTRACT: Data obtained in earlier work of one of the authors (Ref 2) and entered in Table 1 on the relation between the hardness (determined by drilling, grinding, micro-hardness and the Brinell method), the lattice energy. U and the magnitude of the molecular concentration α, which is proportional to this magnitude, shows that the relative hardness increases with increasing values of U and α. The authors considered it of interest to compare the hardness of alkali-haloid alloys with the magnitudes characterising the particle interaction in the lattice. The hardness was determined in single crystals by drilling, mutual grinding and the Brinell method and the micro-hardness was also determined. The drilling was done by a 4 mm dia. drill with an angle at the tip of 90° and the shape of a quadrangular pyramid. The drilling was effected with various loads, the maximum of which was 600 g.

Card1/3

On the Hardness of Ionic Alloys   SOV/139-58-4-14/30

Determination of the hardness by means of mutual grinding
was based on grinding with a standard and determination
of the ratio of the volume ground off the standard to
that ground off the specimen.   The results of determina-
tion of the hardness by means of drilling are graphed in
Fig.1 for freshly grown single crystals of KCl with
admixtures of KBr, NaBr and NaCl; in Fig.2 for freshly
grown single crystals of NaCl with admixtures of NaBr,
KCl and NaI; in Fig.3 the dependence is graphed on the
composition of the solid solution of KCl-KBr of the micro-
hardness H_μ, the hardness determined by drilling, by
mutual grinding and by the Brinell method. Some of the
obtained numerical values are entered in Tables 2-5. It
was found that in freshly grown single crystals the
hardness determined by mutual grinding and drilling can
be expressed by curves with a minimum and the Brinell
hardness and the micro-hardness can be expressed by curves
each with a maximum. After storing for a month, an
increase in the hardness determined by drilling and mutual
grinding is observed for the system NaCl-NaBr. The

Card2/3

On the Hardness of Ionic Alloys   SOV/139-58-4-14/30

    hardness of polycrystals changes according to a more
    complicated law.
    There are 3 figures, 5 tables and 8 references, all
    of which are Soviet.

ASSOCIATION: Tomskiy politekhnicheskiy institut imeni S. M.Kirova
        (Tomsk Polytechnical Institute imeni S. M. Kirov)

SUBMITTED: March 10, 1958

Card 3/3

AUTHORS: Savintsev, P. A. and Vyatkina, A. V.

TITLE: Polycomponent Low Melting-Point Alloys (Polikomponentnyye legkoplavkiye splavy)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, 1958, Nr 4, pp 120-122 (USSR)

ABSTRACT: Paper presented at the Inter-University Conference on Dielectrics and Semi-conductors, Tomsk, February, 1958. Experiments are described which were aimed at producing by means of contact fusion alloys consisting of 5, 6 and 7 components. The method of contact fusion has been described in earlier work of one of the authors and his team (Ref 1). Information on the low melting point alloys which were produced by the method of contact fusion is given in Tables 1-3; of the produced alloys the alloy consisting of seven components contains the following elements: bismuth-germanium-indium-cadmium-tin-lead-zinc and its fusion temperature is $46^{\circ}C$. There is reason to assume that low melting point alloys exist with even more than seven components. It can be assumed that poly-component eutectics are also formed during pressing of crystal powders when pure crystals and crystals with

Card1/3

Polycomponent Low Melting-Point Alloys   SOV/139-58-4-19/30

admixtures get into contact as well as in cast structures;
formation of such eutectics is bound to have an influence
on the properties of the alloys.   The contact fusion of
the crystals is attributed to the considerable mobility of
particles at the contact surface which leads to the
formation of a deorientated layer of a variety of differing
particles.   The interaction of the contacting particles
can also be influenced by the temperature; at a temperature
lower than the contact fusion temperature, the interaction
of uniform particles predominates over that of the inter-
action of differing particles and the formation of a liquid
phase is out of the question, whilst at a temperature above
the contact fusion temperature, the interaction between
differing particles is a predominant one which leads to the
formation of a liquid layer at the contact of the crystals.
Acknowledgment is made to Prof. A. A. Vorob'yev for his

Card2/3

Polycomponent Low Melting-Point Alloys   SOV/139-58-4-19/30

    critical evaluation of the work.
    There are 3 tables and 2 references, both of which are
    Soviet.

ASSOCIATION: Tomskiy politekhnicheskiy institut imeni S.M.Kirova
    (Tomsk Polytechnical Institute imeni S. M. Kirov)

SUBMITTED: March 18, 1958

Card 3/3

SAVINTSEV, P.A.

Physical properties of crystals. Izv.TPI 86:216-223 '58.
(MIRA 13:5)

(Crystals)

SAVINTSEV, P.A.; ABRAMOVICH, L.Ye.

Wearing of crystals and surface energy of eutectic
KCl - K_2CrO_4 and Bi - Sn systems with mutual grinding with
an abrasive powder. Izv.TPI 86:224-230 '58.
(MIRA 13:5)

(Crystallography) (Systems(Chemistry))

SAVINTSEV, P.A.

Molecular concentration and some properties of eutectic alloys. (MIRA 14:9)
Izv. TPI 95:146-151 '58.   (Eutectics)

SAVINTSEV, F.A.

Molecular concentration and the physical and chemical properties
if ionic crystals. Izv. TPI 95:152-168 '58.   (MIRA 14:9)
                        (Ionic crystals)

SOV/112-59-23-47253

Translation from: Referativnyy zhurnal Elektrotekhnika, 1959, Nr 23, p 11,
(USSR)

AUTHOR: Savintsev, P.A.

TITLE: Physicochemical Properties of Solid Solutions and Molecular
             Concentration

PERIODICAL: Izv. Tomskogo politekhn. in-ta, 1958, Nr 95, pp 169 - 175

ABSTRACT: Physicochemical properties of ionic crystals, taken from literary
             sources, are compared with the molecular concentration α defined
             as a ratio of the density of α crystal to its molecular weight.
             With an increase of α the electric strength of alkali-haloid
             crystals with admixtures increases and dielectric losses decrease.
             Properties of metallic crystals are correlated with α. With an
             increase of α, decreases the thermal coefficient of expansion
             of Cu alloys with Sb, Si and Zn, and Au alloys with Ag and Cu.
             17 references.
                                                A.A.V.

Card 1/1

SAVINTSEV, P.A.; IVANKINA, M.S.

Heat for formation and molecular concentration of ionic compounds and their solid solutions. Izv. TPI 95:176-182 '58. (MIRA 14:9)

1. Predstavleno professorom doktorom A.A.Vorob'yevym.
(Ionic crystals) (Solutions, Solid)

SAVINTSEV, P.A.; IVANKINA, M.S.

Regularity of certain physical properties of chemical compounds.
Izv. TPI 95:183-191 '58.   (MIRA 14:9)
           (Crystal lattices) (Periodic law)

SAVINTSEV, P.A.; AVERICHEVA, V.Ye.

Melting points of the contact layer in crystals. Izv. TPI 95:
242-247 '58.   (MIRA 14:9)

1. Predstavleno professorom doktorom A.A.Vorob'yevym.
   (Melting points) (Alkali metal halides--Thermal properties)

AUTHORS: Savintsev, P. A., Avericheva, V. Ye.   SOV/79-28-6-58/63

TITLE: On the Problem of Contact Melting of Crystals (K voprosu o
             kontaktnom plavlenii kristallov)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 6,
             pp. 1700 - 1701 (USSR)

ABSTRACT: The authors mention the inaccurate data in the paper by M.Kh.
             Gluzman and V.P.Rubtsova (Ref 1) dealing with the contact
             melting of the organic systems consisting of three and four com-
             ponents, which are of a cryohydric nature. The contact melting
             can be explained, as the authors write, by the different conver-
             sion between similar and different atoms (Ref 2); in the solid
             state the conversion between similar atoms is prevailing, and in
             liquid state that of different atoms. The temperature of contact
             melting is the temperature at which the transition from one type
             of conversion of the particles to the other takes place. It can
             be assumed that this phenomenon does not only occur in cryohydric
             systems but also in systems forming solid solutions. Therefore
             in such a case the occurrence of contact melting can be expected.
             To prove this the authors carried out experiments with the crystals
             mentioned in the table. The crystals A and B (see table) were

Card 1/3

On the Problem of Contact Melting of Crystals   SOV/79-28-6-58/63

brought into contact and heated. At the temperature (t^o) a liquid occurred at the contact. The radiographic investigations of the solidified alloys obtained in contact melting carried out by the authors proved that they had to deal with solid solutions. The system KCl-NaCl is an exception. In this case the radiograph point at a mixture of components. The thermal analysis of the system KCl-NaCl tends to show solid sclutions which decompose at temperatures below 495°. It is obvious that this way the radiographs type KCl-NaCl is explained. Substances forming solid solutions are capable of diffusing into each other, which fact causes their fusion at temperatures lower than the melting point of the components. Further temperature experiments permitted the conclusion that the diffusion processes do not exert any influence on the contact melting of the crystals and that the temperature at which it takes place represents a physical quantity which is determined by the character of the nearness of the particle arrangement. There are 5 refereneces, 5 of which are Soviet.

SUBMITTED: May 29, 1957

Card 2/3

On the Problem of Contact Melting of Crystals   SOV/ 79-28-6-58/63

1. Crystals--Temperature factors

Card 3/3

2o-119-5-26/59

AUTHORS: Savintsev, P. A., Avericheva, V. Ye.

TITLE: On the Melting Temperature of the Contact Layers Between
              Crystals (O temperature plavleniya kontaktnogo sloya kristallov)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 5,
              pp. 936 - 937 (USSR)

ABSTRACT: The physical properties of the polycrystals to a large degree
              depend on the properties of the boundary of the contacting
              grains. Therefore the investigation of those phenomena is of
              interest which take place on the contact surface of crystals.
              Such an investigation can be made easier by the observation
              at the boundary between two monocrystals, as the orientation of
              the surfaces of monocrystals can be changed at random. Also
              such crystals can be investigated which earlier had been sub-
              jected to various influences. Other conditions are valid for
              the surface particles than for the particles in the interior
              of the crystal. They have a greater potential energy and there-
              fore are more mobile. Their mobility decreases with the rise
              of temperature, which fact makes easier the mixing through of
              the particles of the boundary surfaces and can lead to the

Card 1/3

occurence of a liquid phase. At the boundaries of two crystals
eutectic mixtures can form. P. A. Savintsev (Reference 6)
suggested an hypothesis on the dependence of molecular inter-
actions of different and similar particles on the temperature
in order to explain these experiments. The temperature t_1 of
the contact melting is considered to be that temperature at
which the change of the molecular interaction takes place. At
$t < t_1$ the interaction of similar atoms is predominant, and
$t > t_1$ the interaction of different atoms is predominant. A
similar character of the molecular interactions is present also
in the case of crystals which can form solid solutions. In
order to check this assumption experiments were carried out
with alkali-halogene crystals. It was found that the phenomenon
of contact melting does not only occur in the eutectic systems
but also in such systems of alkali-halogenous crystals which
can form solid solutions. In another experimental series such
samples were brought into contact with one another after they
had been heated to the temperature of contact melting. The mel-

Card 2/3

On the Melting Temperature of the Contact Layers   20-119-5-26/59
Between Crystals

         ting took place only at the moment of contact of the samples.
Therefore the previous diffusion might not have any noti-
ceable influence on the temperature of contact melting. The
radiographical investigation showed that because of the contact
melting eutectic structures as well as solid solutions can
form. There are 1 table and 6 references, 6 of which are Soviet.

PRESENTED: December 11, 1957, by A. F. Ioffe, Member, Academy of Sciences,
              USSR

SUBMITTED: December 11, 1957

Card 3/3

VOROB'YEV, A.A., doktor fiz.-mat.nauk nauk prof.; IVANKINA, M.S.;
   KISLINA, A.N., kand.tekhn.nauk; SAVINTSEV, P.A., kand.fiz.-
   mat.nauk.dots.

Physical and chemical properties of insulating crystals. Izv.
vys.ucheb.zav.; energ. 2 no.9:43-47 S '59.
                                    (MIRA 13:2)

1. Tomskiy ordena Trudovogo Krasnogo Znameni politekhnicheskiy
institut imeni S.M.Kirova.
   (Alkali metal halide crystals--Electric properties)

SAVINTSEV, P.A.; KORENDYASEV, M.I.

Contact melting of an ice - salt system. Izv. vys. ucheb. zav.; fiz. no.4:169-170 '59. (MIRA 13:3)

1.Tomskiy politekhnicheskiy institut imeni S.M. Kirova.
(Ice)

68875

S/139/59/000/05/020/026

E201/E191

18.7500

AUTHORS: Savintsev, P.A., Avericheva, V.Ye., Zlenko, V.Ya.,
           Vyatkina, A.V., and Ignat'yeva, M.I.

TITLE: On the Nature and the Linear Velocity of Contact Melting

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,
            1959, Nr 5, pp 128-133 (USSR)

ABSTRACT: Contact melting is used in preparation of alloys (Ref 1)
           and in physico-chemical analysis (Ref 2). It was
           suggested (Ref 3) that contact melting of alkali-halide
           crystals is due to formation of a low-melting-point
           solid solution by mutual diffusion of the components.
           To study contact melting in greater detail the authors
           measured the temperature dependence of the lattice
           constants of components in the eutectic mixture of
           powders $KCl-KI$ (Figs 1 and 2), the temperature dependence
           of the surface and bulk diffusion coefficients in
           $KCl-NaCl$ (Table 1), $KCl-KBr$, and $KCl-KI$ monocrystals, the
           temperature dependence of the electrical conductivity of
           the powder mixtures $KI-NaCl$ (Table 3), $KI-NaBr$ (Table 3),
           and the heat of formation of the eutectic alloys
           $KCl-K_2CrO_4$ (Table 2), $KCl-KI$ (Table 2). The authors used
           the X-ray diffraction method developed for high

Card
1/3

68875

S/139/59/000/05/020/026

E201/E191

On the Nature and the Linear Velocity of Contact Melting

temperatures at the Institute of General and Inorganic
Chemistry, Acad.Sci. USSR (Ref 4). The experiments
showed that the contact melting in crystals with
unlimited mutual solubility and in crystals forming
eutectic alloys is similar. Contact melting can be
considered as a proof of mutual solubility of the
components. The initial stage of contact melting is a
diffusion process. This process produces a layer which
is the lowest-melting-point alloy of the two components.
The next stage is formation of a liquid layer with
subsequent dissolution of the solid components in this
liquid. The later stages of contact melting can be
described in terms of a "linear velocity" which is the
rate of reduction of the length of a rod-shaped sample
(Table 4). This velocity can be related to the physical
and chemical properties of the components and their melt
(Table 5).

Card
2/3

There are 2 figures, 5 tables and 9 Soviet references.

VOROB'YEV, A.A.; ZAVADOVSKAYA, Ye.K.; IVANKINA, M.S.; SAVINTSEV, P.A.

Physical properties of solid solutions of alkali halide compounds, and the molecular concentration. Izv.vys.ucheb.zav.; fiz. no.6:162-165 '59. (MIRA 13:6)

1. Tomskiy politekhnicheskiy institut imeni S.M.Kirova.
(Alkali metal halides) (Solutions, Solid)

SAVINTSEV, P.A.

66170

SOV/143-60-0-7/22

s(e)-set(e)
AUTHORS: Vorob'yev, A.A., Doctor of Physical and Mathematical Sciences, Professor, Zakharov, M.S., Eklin, A.A., Candidate of Technical Sciences, and Savintsev, P.A., Candidate of Physical and Mathematical Sciences, Docent

TITLE: The Physical and Chemical Properties of Insulating Crystals

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Energetika, 1960, Nr 9, pp 45-47 (USSR)

ABSTRACT: During the years of Soviet rule, the scientists of Tomsk performed considerable research in studying the structures and properties of ion crystals and alloys...

Card 1/4

Card 2/4

Card 3/4

ASSOCIATION: Tomskiy ordena Trudovogo Krasnogo Znameni politekhnicheskiy institut imeni S.M. Kirova (Tomsk - Order of the Red Labor Banner Polytechnic Institute imeni S.M. Kirov)

SUBMITTED: April 21, 1959

5 (2), 5 (4)

AUTHORS: Savintsev, P. A., Avericheva, V. Ye.,   SOV/20-127-4-28/60
             Zlenko, V. Ya.

TITLE: On the Nature of Contact Fusion of Alkali-halide Crystals

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 4, pp 828 - 830
             (USSR)

ABSTRACT: The mechanism and kinetics in the formation of contact fusion
             alloys (eutectic alloys or solid solutions are formed) have not
             yet been investigated. A diffusion-like nature was ascribed to
             the contact fusion alloys. There is an unlimited mutual solu-
             bility in these alloys. To clarify the processes taking place
             in the formation of contact fusion alloys, the alkali-halide
             mixtures were X-rayed at high temperatures. The methods and the
             X-ray high-temperature camera developed by the X-Ray Laboratory
             of the Institut obshchey i neorganicheskoy khimii AN SSSR (In-
             stitute of General and Inorganic Chemistry of the AS USSR) were
             used for the investigation. In the Debye diagram, the lines of
             the single components KCl-NaCl, observed up to 600°, disappear
             at 635°, and the lines of the solid solutions appear. In the

Card 1/3

system KCl-KJ, the lines of the components are present at
temperatures $t < 300°$, at $t > 500°$ they are shifted (formation
of the solid solutions KCl in KJ and KJ in KCl). Due to the
expansion by heat, the lattice periods of both the components
grow at first. In the beginning diffusion process, the period
of the alloy-KCl grows fast, and the period of KJ becomes
smaller again. The diffusion process was investigated by means
of the monocrystals KCl-KBr, NaCl-NaBr, and KCl-KJ at tempera-
tures near those of the contact fusion alloy. Further, the
crystals were tempered, for different periods of time, at the
given temperatures, and the compositions originating on the
contact surface were investigated by X-rays. It was shown that
with the approach to the temperature of the contact fusion al-
loy the tempering times became smaller to attain the composi-
tion corresponding to the minimum of the melting diagram of
the system KCl-KBr. Similar results were obtained for the
system NaCl-NaBr. In the system KCl-KJ, limited solid solu-
tions were formed on both contact surfaces at $500°$. The ob-
servation of the appearance of the contact fusion alloys in-
dicates the mutual solubility of the components. The measure-

Card 2/3

On the Nature of Contact Fusion of Alkali-   SOV/20-127-4-28/60
halide Crystals

        ment results concerning the formation heat of solid eutectic
        alloys are compiled in table 1. There are 2 figures, 1 table,
        and 11 Soviet references.

PRESENTED: April 8, 1959, by V. D. Kuznetsov, Academician

SUBMITTED: April 8, 1959

Card 3/3

SAVINTSEV, P. A., Doc Phys-Math Sci -- (diss) "Some physicochemical
properties of eutectic alloys and contact fusion." Tomsk, Tomsk Univ-
ersity Publishing House, 1960. 16 pp; (Tomsk State Univ im V. V. Kuy-
byshev); 150 copies; price not given; (KL, 50-60)/131)

69434

S/139/60/000/01/008/041
E032/E414

24,7700

AUTHOR: Savintsev, P.A.

TITLE: The Valence Electrons of the Atoms of Metals and Their
             Properties

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,
             1960, Nr 1, pp 54-56 (USSR)

ABSTRACT: The physical and chemical properties of metals are
             mainly determined by the structure of their electron
             shells. A comparison of the properties of metals with
             their electronic structure makes it necessary to divide
             pure metals into three electro-chemical classes:
             transition metals, nontransition metals with valence
             s-electrons, and nontransition metals with valence
             sp-electrons. Tables 1, 2 and 3 show the relevant
             physical properties used in this classification scheme.
             The table headings are as follows:
             Table 1 -   Solubility of elements in silver, copper and
             lead.   Col 1, Solvent; Col 2, Solute; Col 3, Valence
             electrons of the components; Col 4, Molecular
             concentration (Subscript 1 refers to the solvent and
Card 1/2

S/139/60/000/01/008/041
69434
E032/E414

The Valence Electrons of the Atoms of Metals and Their Properties

subscript 2 to the solute); Col 5, Maximum
Solubility in % at.
Table 2 - Comparison of diffusion coefficients of
various elements in germanium. The diffusion
coefficient is given in the last column (Asterisk
indicates transition metals).
Table 3 - Melting point and the composition of
binary eutectics. The last column gives the
concentration of the second component in % at.
Acknowledgement is made to Professor A.A.Vorob'yev for
valuable discussions. There are 5 references, 4 of
which are Soviet and 1 English.

ASSOCIATION: Tomskiy politekhnicheskiy institut imeni S.M.Kirova
(Tomsk Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: February 18, 1959

Card 2/2

69436

S/139/60/000/01/012/041
E073/E435

24.7500

AUTHORS: Savintsev, P.A. and Botaki, A.A.

TITLE: Modulus of Elasticity of Alkali Haloid and Metallic
            Alloys

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,
            1960, Nr 1, pp 68-72 (USSR)

ABSTRACT: Numerous physical properties of crystals are
            determined by the interaction of the atoms of the
            crystal lattice. It is therefore of interest to
            measure physical constants which characterize the
            relation between individual particles of the lattice,
            these constants include the modulus of elasticity of the
            crystals. By using ultrasonic methods it is possible to
            determine the Young modulus more accurately than by
            static methods. The authors of this paper measured
            the Young modulus by means of a piezo-quartz resonator
            consisting of a piezo-quartz rod to the end of which a
            sound-conducting rod was glued, by means of shellac,
            and then the investigated specimen. The Young modulus
            was determined for alkali haloid crystals and their

Card 1/3

69438
S/139/60/000/01/012/041
E073/E435

Modulus of Elasticity of Alkali Haloid and Metallic Alloys

solid solutions, and also for a number of metals and
alloys. In table 1, the thus-determined Young
modulus of haloid single crystals is compared with the
energy of the crystal lattice U, the molecular
concentration α, the microhardness, and the hardness:
it can be seen that for Na and K compounds U, α,
the microhardness and the hardness increase with
increasing value of the Young modulus. In Table 2,
the Young modulus values are entered for single crystals
of the solid solutions NaBr-NaCl, NaBr-KBr, KBr-KCl;
in these systems the Young modulus is smaller than the
respective additive value. This is in agreement with
other properties of the considered equimolar alloys,
entered in Table 3. In the case of the eutectic
systems Pb-Sn, Pb-Sb, Pb-Cd, Sn-Cd, Sn-Bi, Cd-Zn
(entered in Table 4), the measured values of the Young
modulus are identical with the sum of the additive
values. The following conclusions are arrived at:
1) Formation of the solid solutions NaBr-KBr,

Card 2/3

69438
S/139/60/000/01/012/041
E073/E435

Modulus of Elasticity of Alkali Haloid and Metallic Alloys

NaBr-NaCl, KBr-KCl, is accompanied by a weakening of
the bonds between the lattice ions; 2) The diagrams
modulus of elasticity - composition of alkali haloid
solid solutions are in good agreement with other
property diagrams, eg heat of formation - state,
coefficient of linear expansion - state, relative
number of particles in the elementary cell - state of
the solid solution; 3) The eutectic points on the
diagrams modulus of elasticity - state of the alloys
Bi-Cd and Cd-Zn differ in their properties from other
alloys with almost similar concentrations. There are
4 tables and 9 Soviet references.

ASSOCIATION: Tomskiy politekhnicheskiy institut imeni S.M.Kirova
(Tomsk Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: January 16, 1959

Card 3/3

S/139/60/000/03/042/045
E032/E314

AUTHORS: Vorob'yev, A.A., Savintsev, P.A. and Ufimtsev, B.F.

TITLE: The Ionisation Potentials of Atoms and the Mutual
             Solubility of Metals

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,
             1960, No 3, pp 233 - 234 (USSR)

ABSTRACT: Depending on the type of interaction between the
             components, fused metals can form various types of
             alloys, e.g. eutectic mixtures, solid solutions or
             chemical compounds. It is well known that there is
             a definite periodicity in the ionisation potentials
             of elements, depending on their position in the periodic
             table. It is argued that intermetallic compounds are
             formed when the ionisation potentials of the two metals
             are considerably different. Conversely, in the case of
             eutectic alloys, the ionisation potentials of the
             components are roughly the same. Solid solutions are
             formed when the difference between the ionisation
             potentials of the components approach a certain average
             value. These ideas are illustrated in Table 1, in which
             eutectic alloys are shown on the left and solid solutions

Card1/2

The Ionisation Potentials of Atoms and the Mutual Solubility of
Metals

on the right. φ_1 and φ_2 are the ionisation potentials
and $\Delta\varphi$ is the difference between them.
There are 1 table and 2 Soviet references.

ASSOCIATION: Tomskiy politekhnicheskiy institut imeni S.M. Kirova
(Tomsk Polytechnical Institute imeni S.M. Kirov)

SUBMITTED: October 26, 1959

Card 2/2

S/139/60/000/004/040/04 , XX
E073/E535

26.2510

AUTHORS: Savintsev, P. A., Avericheva, V.Ye. and Kostyuzua/ . . V.

TITLE: On the Speed of Contact Fusion of Alkali-Haloid Crystals

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960,
            No.4, pp.107-109

TEXT: In earlier work (Ref.5) the authors stated that contact
fusion is observed in crystals forming eutectic alloys or
continuous series of solid solutions which have a minimum on the
fusibility curve. In later experiments (Ref.6) the authors measured
the temperature dependence of the lattice periods of the components
in the mixture of KCl and KI powders, the temperature dependence of
the coefficient of the surface and volume diffusion in single
crystals of KCl-NaCl, KCl-KBr, KCl-KI and the temperature dependence
of the electric conductivity of the mixtures of the powders KI-NaCl,
KI-NaBr.   They found that the initial stage of contact fusion of
the crystals under consideration is the mutual dissolution of the
solid components; this continues until interlayers of solid solutions
form along the contact boundaries, the compositions of which
correspond to a minimum of the fusibility curve or to the boundaries
of solubility of the eutectic systems. The easily fusible interlayers
Card 1/3

85084

S/139/60/000/004/040/044/XX
E073/E535

On the Speed of Contact Fusion of Alkali-Haloid Crystals

fuse and in the thus formed liquid phase the solid components dissolve.   The last stage of the process can be characterized by the speed of contact fusion which corresponds to the speed of dissolution of the crystals at elevated temperatures in a solvent consisting of the liquid solution of its components.   In the work described in this paper the speeds of contact fusion were measured for a number of alkali-haloid crystals on pressed powder specimens of the investigated salts, 6.5-3.5 mm high and 12.2 mm diameter. From the experimentally determined linear speed of contact fusion, the activation energy of the contact fusion was determined for NaCl in KCl, NaCl in KI, KI in KCl and NaBr; these were respectively (in cal/mol): 37850, 45200, 35300, 17000.   The following conclusions are arrived at:
1) The linear (and specific) speed of contact fusion of alkali-haloid crystals coincides with the speed of the solution of the crystal in the melt, which represents the solution of the given component (NaCl, KI) in the other component.
2) The linear (and specific) contact fusion depends on the temperature and obeys the law $v \sim e^{(-U/RT)}$.

Card 2/3

85084

S/139/60/000/004/040/6 /XX
E073/E535

On the Speed of Contact Fusion of Alkali-Haloid Crystals

3) The linear speed of contact fusion can be utilised as a character-
istic of the last stage of the process of contact fusion of alkali-
haloid crystals.
It was also found that, irrespective of the temperature of over-
heating during contact fusion, the composition of the obtained
alloys will not vary greatly. This is shown by numerical values
obtained for the system KI-NaBr, where the contents of the individual
components varied only by 1% as a result of temperature variations
between 587 and 655°C. There are 1 figure, 3 tables and 7 references:
all Soviet.

ASSOCIATION: Tomskiy politekhnicheskiy institut imeni S.M.Kirova
                (Tomsk Polytechnical Institute imeni S.M. Kirov)

SUBMITTED: September 21, 1959

Card 3/3

S/0+2/o0/005/005/012/021
B015/A029

AUTHORS: Vorob'yev, A.A., Professor, Zavadovskaya, Ye.K., Professor,
             Boldyrev, V.V., Candidate of Chemical Sciences, Melik-Gaykazyan,
             I.Ya., Candidate of Physical and Mathematical Sciences, Savintsev,
             P.A., Candidate of Physical and Mathematical Sciences

TITLE: Physico-Chemical Problems of Dielectrics

TEXT: Dielectrical materials should have a high thermal, chemical and radi-
ation resistance, a high mechanical and electrical strength, in some cases
they should have a low value of the angle of losses, a low electroconductiv-
ity and a high dielectrical constant (Ref.1). Some of the more recent
fields of application are scintillation counters, where the dielectrics with
a large width of the forbidden zone of energy are used, or in explosives
(Ref. 2), where the electronic and ionic processes which occasionally take

1/9

20623

S/063/60/005/005/012/021
A051/A029

Physico-Chemical Problems of Dielectrics

place in the dielectrics are applied. In outlining the physico-chemical properties of dielectrics, the connection between these properties are discussed in reference to the energy of the lattice. It is pointed out that, since little is known of the physical processes in dielectrics when acted upon by an electrical field, chemistry and the science of electrical materials is mostly empirical. The physical properties of dielectrics in relation to their chemical composition and structure were studied. The dielectrical properties of simple substances with a known chemical composition were investigated (Ref. 1,4-24). It was found that the main properties of the dielectrics (thermal resistance, binding energy of the eletron in the lattice, mechanical strength, optical properties, etc.), were directly determined by the strength and nature of the particle bond in the lattice. Under the effect of external conditions the interaction energy between these particles can be overcome and the lattice destroyed. A number of graphs are presented indicating how the various properties are affected by the lattice energy, i. e., the energy value necessary to divide the crystal lattice, consisting of ions, to individual ions and separation of these from one another to an infinitely large distance at a temperature of absolute zero. The case of binary ionic compounds of the $A_m F_n$ type, as described by Kapustinskiy (Ref. 25),

Card 2/9

20623

Physico-Chemical Problems of Dielectrics

is given where the calculation of the energy of the lattices with a coordination number 6, is estimated according to formula (1): $U = 256.1$ $\frac{(a + b)W_A \cdot W_B}{R_A + R_B}$, where a is the number of cations, b the number of anions, W_A and W_B the valencies of the anion and the cation, R_A and R_B the radii of the corresponding ions for the structure of a lattice of the sodium chloride type. A later version of the formula, where also the repulsion, as well as the attraction of the ions is considered, is given as:

$$U = 287.2 \frac{W_A \cdot W_B (a + b)}{R_A + R_B} \left(1 - \frac{0.345}{R_A + R_B}\right) \quad (2).$$ The ionic crystals have a high

value of lattice energy and thus also a high value of thermal and mechanical strength. In the case of isodesmic ionic lattices of the same structural type, the properties of the materials are connected with the energy of the crystal lattice determined by the chemical composition. Fig.1 is a graphical representation of the effect of the hardness according to Moos, melting point, electrical strength of the ionic crystals by the lattice energy, Fig. 2 shows the same relationship for alkali earth metal oxides. From equation 1 it is seen that with a decrease in the size of the particles, which make up

Card 3/?

20623

S/063/60/005/005/012/021
A051/A029

Physico-Chemical Problems of Dielectrics

the lattice, the lattice energy increases. Fig.3 represents the relationship
between the change in volume of an elementary nucleus of a molecule (Ref. 3)
in various compounds according to data from X-ray analyses, and the lattice
energy for crystals of alkali-halide compounds. Fig.4 gives the relation-
ship of the number of ions n in one cm^3 to the lattice energy for crystals of
alkali-halide salts. The value of n was determined from:

$$n = \frac{N \cdot d}{2(A_1 + A_2)}$$ (3), where N is = $6.06 \cdot 10^{23}$, d the specific gravity, A_1 and A_2

atomic weights of the ions. The specific thermal capacity c_p, at a constant
pressure, is given in Fig.5 in relation to the lattice energy, and Fig.6 shows
the relationship of the melting heat to the lattice energy. Experiments show-
ed that the optical properties of ionic crystals also depend on the lattice
energy. With an increase in the latter, the absorption of light changes in
the infrared, visible and ultraviolet regions according the certain rules.
The electronic polarizability in relation to the lattice energy for alkaline
halides is shown in Fig.8 (Ref. 30,31). A decrease or an increase of the di-
electrical constant and of its components will be noted due to the shift in
the ions corresponding to the change in the ion polarizability of the ions
and their concentration with a change in the lattice energy. Fig.9 repre-

Card 4/9

30633
S/062/60/000/005/012/021
A051/A029

Physico-Chemical Problems of Dielectrics

sents the change in the electronic component of the dielectrical constant
with a change in the lattice energy for crystals of the alkali-halide com-
pound series. The relationship of the electroconductivity to the tempera-
ture of ionic crystals is described by the formula:

$$\sigma = \sigma_1 e^{-u_1/kT} + \sigma_2 e^{-u_2/kT}$$, where u is the activation energy of the libera-
tion processes of the ions in the lattice. Experimental data showed that a
significant increase of the high-temperature range of the activation energy
takes place with an increase in the lattice energy of the alkali-halide salt
crystals. The sum of the activation energies at low and high temperatures
was found to depend on the lattice energy. The conclusion is drawn here
that the electroconductivity of the crystals is connected with the energy of
the crystal lattice in a law sequence. Other properties, such as the effect-
ive mass of the electron and the magnitude of the oscillating quantum, are
also thought to depend on the lattice energy. It is pointed out here that
these relationships must be accurately established. The electrical strength
of the dielectric is thought to increase with an increase in the lattice
energy (Fig.10). Other properties, such as the thermal resistance of the

Card 5/9

20623

Physico-Chemical Problems of Dielectrics   S/0 /60/ 5/ 5/012/021
A051/A029

ionic crystals are in a reverse relationship to the lattice energy, but this
phenomenon is assumed to be illusionary, since the decomposition of these
substances is also determined by the ionization potential, as well as the
lattice energy. The reverse relationship is also observed in the case of the
heterodesmic structures. Data obtained from Refs. 9,10 on a comparison of the
physico-chemical properties of liquid and gaseous organic dielectrics with
their electrical strength in the aliphatic hydrocarbon series showed that the
electrical strength changes sympatically with the change in the intermolecu-
lar bond strength and does not depend on the bond strength within the mole-
cule. These results were used to form a graph of the spark-over of the or-
ganic dielectrics (Fig.11). Further mention is made of the connection be-
tween the physico-chemical properties of dielectrics and the lattice energy
when the structure is destroyed. The contraversial facts noted in real crys-
tals, viz., the mechanical properties of these single crystals changing ac-
cording to certain rules with the change in the lattice energy, are explain-
ed by the behavior of the defects, especially of dislocations, i.e., by the
energy of the crystal lattice. One of the possible means for obtaining a
controllable concentration of the defects in the lattice is the formation of
solid solutions. Upon investigating the electrical properties of the solid
Card 6/9

Physico-Chemical Problems of Dielectrics

20623

S/043/60/005/005/012/021
A051/A029

solutions CaO-ZrO$_2$, a defect in their structure was noted (Ref. 47). A complex investigation of the physical properties of the solid solutions KCl-RbCl, KCl-KBr, NaCl-NaBr was carried out. It was proven that the general characteristic, which determines the physical properties of a complex dielectric, was the heat of formation. It is expected that a drop in the interaction forces would involve a drop in the strength and an increase in the defect of the solid solution. The relationship between the heat of formation of the solid solution and the average number of particles n included in the volume of the elementary nucleus (for an ideal single crystal n = 8) leads to the conclusion that the more heat absorbed in the formation of the solid solution, i.e., the lower the energy of interaction of the particles in the crystal lattice of the crystal, the more defective is its structure. The connection between the defectiveness of the structure and the lattice energy leads the authors to assume that the laws obtained for the single crystals are also applicable to the polycrystals used commercially. Finally, the authors discuss the connection between the physico-chemical properties of solid solutions of alkali-halide salts. It is said that the introduction of admixtures into the crystal can lead to a change in the interaction between the particles of the crystal lattice of the substance. Experimental data on the physico-chemical

Card 7/9

20623

Physico-Chemical Problems of Dielectrics   S/063/60/005/005/012/021
A051/A029

properties of solid solutions of ionic compounds are compared and certain assumptions are therefrom derived on the interaction of ions in the investigated systems. The most important value characterizing solid solutions is their heat of formation and reference is made to the formula used by Grimm (Ref. 61) for calculating the energy of the crystal lattice. The heat of formation of the solid solution is estimated experimentally as the difference between the heats of dissolution of the solid substance and the mechanical mixture of components having the same weight and composition. The connection between the heat of formation and the electrical properties of the alkali-halide solid solutions is noted. The electrical strength of NaCl-NaBr, KBr-KJ, KCl--KBr, NaBr-KBr is lower than that of the components. Solid solutions formed by heat absorption have a weakened structure and are characterized by a lowered electrical, schematic and thermal strength, high dielectrical losses and a defective structure. The electrical characteristics of dielectrics are connected with other properties, e.g., in the case of ionic crystals with the lattice energy, in homeopolar crystals with the energy of atomization, in molecular crystals with the energy of intermolecular bonds and in solid solutions with the amount of heat liberated in their formation. All these values are the higher, the higher the mechanical, thermal, chemical and elec-

Card 8/9

Physico-Chemical Problems of Dielectrics

20623
S/063/60/005/005/012/021
A051/A029

trical strength of the dielectrics. The authors point out that in selecting new materials for dielectrics compounds with highly-charged atoms (boron, silicon, etc.), should be combined with non-deforming atoms creating rigid bonds (nitrogen, fluorine, etc.). It is worthwhile to investigate the possibilities of using temperatures and pressures obtained in explosive processes and electrical explosions when producing dielectrics to overcome the high activation barriers of the reaction. The problem of selecting new dielectrical materials is a matter for the chemist, as well as the physicist. There are 15 figures, 4 formulas, 1 table and 81 references: 62 Soviet, 12 English, 6 German, 1 unidentified.

Card 9/9

34166

S/139/61/000/006/004/023
E039/E420

AUTHORS: Berzina, I.G., Botaki, A.A., Savintsev, P.A.

TITLE: Changes in the modulus of elasticity and microhardness with exposure (to radiation)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Fizika, no.6, 1961, 30-34

TEXT: It is well known that radiation causes changes in crystalline systems. In particular, irradiation with electrons increases the Young's modulus of various metals up to a limiting value. Similarly, irradiation of single crystals of copper with γ-radiation produces an increase in the modulus of elasticity. In addition, the Young's modulus for graphite and single crystals of copper is substantially increased by irradiation with neutrons in a reactor. In this paper it is shown that the modulus of elasticity of the eutectic alloy Zn-Cd increases by about 2.5% after storage for one year after preparation, whereas in the case of Pb-Bi the modulus increases by about 6% after 45 hours. These changes in Young's modulus were determined by an ultrasonic method. The effect of exposure to slow neutrons and γ-radiation from a

Card 1/4

Changes in the modulus ...

S/139/61/000/006/004/023
E039/E420

34185

radium beryllium source (4.8×10^6 n sec) on the Young's modulus for bismuth and tin was also examined. A maximum increase of about 1% is reached after 70 and 100 hours exposure respectively (Fig.2,3). The effect of irradiation by high energy γ-radiation (15 MeV) on bismuth and tin is similar, showing an increase in modulus of about 2% after a few hours exposure. In the case of rock salt a dose of 3000 r (25 MeV γ) increased the Young's modulus by about 1%. The change in Young's modulus $\triangle E$ caused by irradiation of Zn-Cd alloys of various Zn content to X-radiation is shown in Fig.5. $\triangle E$ passes through a sharp maximum at about 29% Zn. An exposure of 30 min to 1.2 MeV γ radiation changed the microhardness of the Bi-Pb alloy from 3.05 to 5.52 kg/mm^2 and for the Bi-Sn alloy from 4.10 to 6.60 after 25 hours. In the case of Zn-Cd, an exposure to 130 r/min of 48 kV X-rays resulted in an increase in microhardness from 24.4 kg/mm^2 to a maximum of 30.2 kg/mm^2 after 2 hours, after which it fell rapidly to near its normal value. There are 5 figures, 4 tables and 14 references: 3 Soviet and 11 non-Soviet-bloc. The four most recent references to English language publications
Card 2/4

34186
S/139/61/000/006/004/023
Changes in the modulus ...   E039/E420

read as follows: Ref.1: H. Dieckamp, A. Sosin. J. Appl. Phys.,
v.27, no.12, 1956; Ref.2: D.D.Thompson, D.K.Holmes. J. Phys. and
hem. Solids, v.1, no.4, 1957; Ref.5: H.S.Selers, D.A.Powell et al,
Bull. Am. Phys. Soc., II, no.1, 1956, 379; Ref.10: D.D.Thompson,
T.H.Blewitt, D.K.Holmes. J. Appl. Phys., v.28, 1957, 742.

ASSOCIATION: Tomskiy politekhnicheskiy institut imeni S.M.Kirova
             (Tomsk Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: July 15, 1960

                              Fig.2.
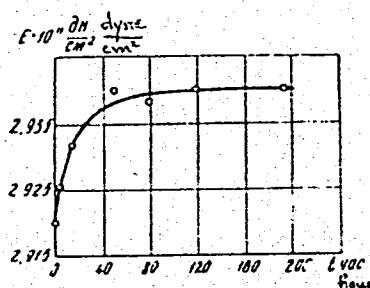
Card 3/4

Changes in the modulus ...

34186

S/139/61/000/006/004/023
E039/E420

Fig.3.

Fig.5.

Card 4/4

3419
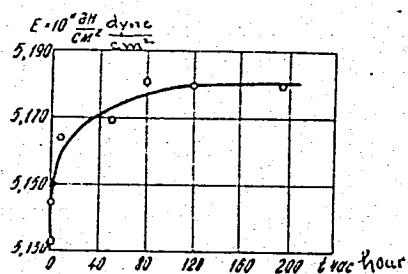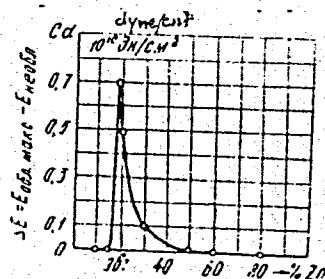
S/139/61/000/0 6/016/023
E073/E535

/.Y3 0

AUTHORS: Savitskaya, L.K. and Savintsev, P.A.

TITLE: On the nature of contact fusion

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, no.6,
               1961, 126-131

TEXT: The aim of the author was to investigate the
following two points during the process of contact melting:
a) whether after some liquid has formed, pure metals are being
dissolved or whether the surface contains some layer in which solid
solutions form before this layer becomes molten;
b) whether the process of contact melting changes if instead of
pure metals being in contact with each other, the contact is
between a solid solution and a pure metal.
For this purpose the fusion rate at various temperature of solid
solutions of bismuth in tin in contact with bismuth and the
fusion rate of pure bismuth in contact with tin-base alloys
containing additions of bismuth were studied. Furthermore, the
width of the region with variable concentrations of the components
at the boundary between the solid crystal and the liquid was

Card 1/3

34196

On the nature of contact fusion   S/139/61/000/006/016/025
                                        E073/E535

investigated.   The wide range of solubility in the solid state
of this system permits varying within wide limits the concentration
of the solid solution and studying the nature of the dependence of
the process of contact fusion on concentration.   Tin-base alloys
containing 1, 5.5, 8.5, 17 and 19 wt.% of bismuth were used in the
experiments.   It was found that during the process of contact
fusion of Sn with Bi a continuous s e r i e s of solid solutions
f o r m   at the surface of the tin which is bounding on the liquid.
Preliminary introduction of the bismuth in the tin reduces the
thickness of the surface layer on which solid solutions form.
Preliminary solution of bismuth in tin within the limits of the
solid solution leads to an acceleration of the fusion of the tin
which is in contact with the bismuth; there is an increase in the
rate of contact fusion with increasing concentration of the solid
solution.   Alloys of tin and bismuth, which were in a two-phase
state at the experimental temperatures, had a very high fusion
rate when in contact with bismuth, which indicates that the liquid
phase is of predominant importance during contact fusion.   There
are 6 figures and 11 references: 10 Soviet-bloc and 1 non-Soviet-
bloc.   bloc.

X

On the nature of contact fusion   34156
                                   S/139/61/000/006/016/023
                                   E073/E535

The English-language reference reads as follows: Ref.9; James F.
Lynch, Lester Feinstein, Robert A. Huggins. Welding Journal, No.2,
97-101 (85S-89S), 1959.

ASSOCIATION: Tomskiy politekhnicheskiy institut imeni S.M.Kirova
               (Tomsk Polytechnic Institute imeni S.M.Kirov)

SUBMITTED: April 3, 1961

Card 3/3   X

$\mathcal{2}4.7300\,(1136,\,1160,\,1482)$

AUTHORS: Berzina, I.G., Naumov, A.F. and Savintsev, P.A.

TITLE: On the solution and contact melting of irradiated crystals

PERIODICAL: Kristallografiya, 1961, Vol.6, No.3, pp.460-464

TEXT: Reports of some experiments on the rate of solution and contact melting of crystals of NaCl, Bi, Cd, Pb irradiated with X-rays and with slow neutrons.   The experiments show that rate of solution and the contact melting are structure sensitive characteristics of the crystals.   The authors consider that the effect of radiation on these properties has been neglected.   As regards the rate of solution, this will only be structure sensitive if diffusion effects can be avoided.   In fact no differences are observed between irradiated and non-radiated samples if the solution is not stirred.   Also, excess stirring causes ill defined hydro- dynamic behaviour.   The final experimental arrangement consisted of a plate of salt of thickness 0.93 mm.   A stream of a solution of NaCl in water is passed through a cylindrical hole in the plate of diameter 1.2 mm at a rate such that the Reynolds number

Card 1/4

22796

On the solution and contact ...   S/070/61/006/003/007/009
E036/E435

remained constant at 4000 independently of the strength of the
solution.   In fact, the velocity of the jet was about 4 m/sec.
The experiments were carried out at 21°C.   The X-rays were
provided by a tube with voltage of 47.5 kV and anode current 16 mA.
The target was apparently of Cu.   The crystal was placed at 5 cm
from the centre of the tube.   The dissolution rates were
obtained for radiation times up to 16 hours and rates of
dissolution of irradiated and non-irradiated samples V_{Ir} and
$V_{U.Ir}$ compared.   The ratio $V_{Ir}/V_{U.Ir}$ increased up to a ratio
of about 1.4 after 16 hours irradiation depending on the solution
strength.   The experiment was only carried out on NaCl.   In
contact melting of two crystals A, B, these crystals are
dissolved in a liquid film between the two crystals at a
temperature T_{CM} less than the melting temperature of the pure
crystals.   Normally the crystals are pressed together to give a
thin film.   Experiments were carried out on several pairs of
metals, one of which was irradiated for 50 hours from a radio-
active Be source, which gave slow neutrons (4×10^6 neutrons/sec)
at a distance of 20 cm from the sample which was in the form of
Card 2/4

22796

S/070/61/006/003/007/009
On the solution and contact ...   E036/E435

3 mm diameter tablet of height 1.12 to 1.18 mm, placed in a
paraffin block.   The experiment to determine rate of contact
melting has been described (Ref.9: P.A.Savintsev, V.Ye.Avericheva,
A.V.Vyatkina, V.Ya.Zlenko, M.I.Ignat'yeva, Izv.vyssh.uch. zavedeniy.
(Fizika), 5, 128, 1959) and is carried out for irradiated and
unirradiated samples simultaneously, the times of dissolution of
unit volume being obtained.   The systems investigated were:
irradiated Bi in the Sn-Bi system and irradiated Cd in the Bi-Cd
system.   For temperatures approaching the temperature of contact
melting considerable differences in the time of dissolution of
irradiated and non-irradiated samples were observed,
e.g. differences up to 1000 sec (actual times are not quoted).
In addition to the samples irradiated for 50 hours by neutrons, the
effects were studied for Bi in the Bi-Sn system which had been
irradiated with X-rays for 1 to 30 min at an intensity of about
3500 mcuries/sec.   For a definite dosage saturation of the rate
of contact melting is achieved.   There are 6 figures and
9 references: 8 Soviet-bloc and 1 non-Soviet-bloc.   The reference
to the English language publication reads as follows:
Card 3/4

22796
S/070/61/006/003/007/009
On the solution and contact ...   E036/E435

A.Carlson, "Growth and Perfection of Crystals", N.Y., 1958.

ASSOCIATION: Tomskiy politekhnicheskiy institut im. S.M.Kirova
             (Tomsk Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: August 9, 1960

Card 4/4

S/139/62/000/003/019/021
E195/E383

AUTHORS: Berzina, I.G., Savitskaya, L.K. and Savintsev, P.A.

TITLE: A study of the structure of metals near the [liquid/
/solid] interface during contact fusion

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,
no. 3, 1962, 160 - 165 + 1 plate

TEXT: When two metals which form a eutectic are brought
into intimate contact and heated to a temperature lower than
the melting point of either metal, but higher than the eutectic
temperature, a liquid phase is formed at the plane of contact.
The object of the present investigation was to study the
mechanism of this phenomenon. The experiments were conducted on
Sn-Bi, Sn-Cd and Cd-Zn couples. Cylindrical specimens, prepared
by drawing molten metals into glass tubes, were used with the
contact surfaces made flat by polishing. The technique
described by P.A. Savintsev and A.V. Vyatkina (Izv. vuzov SSSR,
Chernaya metallurgiya, no. 2, 1959, 89) was used to bring about
contact fusion, the holding temperatures of 150 and 280 °C being
used for the Sn-Bi and Cd-Zn couples, respectively. Metallographic
Card 1/2

A study of S/139/62/000/003/019/021
                        E193/E383

examination and measurements of microthermo-e.m.f. (in the plane
normal to the plane of contact) were used to study the structural
changes preceding and accompanying the formation of the liquid
phase. Several conclusions were reached.
1) The formation of a liquid phase at the plane of contact of
two solid metals A and B does not take place until a layer of
a saturated solid solution (A in B and B in A) has been formed
on each contact surface, further dissolution of A and B in the
layer of the liquid phase being also preceded by the same
process.
2) The rate at which the liquid phase is formed is fastest in
the grain-boundary regions.
3) Contact fusion can be used to reveal the presence and to
determine the density of dislocations in the grain-boundary regions.
There are 7 figures.

ASSOCIATION: Tomskiy politekhnicheskiy institut imeni S.M.
                Kirova (Tomsk Polytechnical Institute imeni
                S.M. Kirov)

SUBMITTED: December 27, 1961
Card 2/2

BERZINA, I.G.; SAVINTSEV, P.A.

      Effect of radiation on contact melting of crystals. Izv.
      TPI 122:33-39 '62.   (MIRA 17:9)

BERZINA, I.G.; SAVINTSEV, P.A.

      Contact melting of irradiated crystals. Kristallografiia 7
      no.1:159-162 Ja-F '62.   (MIRA 15:2)

     1. Tomskiy politekhnicheskiy institut im. S.M. Kirova.
             (Metals, Effect of radiation on)
                 (Melting)

SAVINTSEV, P.A.; NAUMOV, A.F.; BERZINA, I.G.

  Kinetics of the dissolution of crystals following irradiation.
  Izv. TPI 122:39-44 '62.   (MIRA 17:9)

ANOKHINA, I.N.; BERZINA, I.G.; SAVINTSEV, P.A.

Coefficient of linear expansion of irradiated alkali halide crystals.
Kristallografiia 7 no.4:637-639 Jl-Ag '62.   (MIRA 15:11)

1. Tomskiy politekhnicheskiy institut imeni Kirova.
                    (Alkali metal halide crystals)
                    (Metals, Effect of radiation on)

BERZINA, I. G.; SAVITSKAYA, L. K.; SAVINTSEV, P. A.

Structure of metals near the interface in contact melting.
Izv. vys. uch. zav.; fiz. 3:160-163 '62.
(MIRA 15:10)

1. Tomskiy politekhnicheskiy institut imeni S. M. Kirova.

(Melting)   (Metals)

L 6907-65   EWT(1)/EWT(m)/EPF(c)/EPF(n)-2/T/EEC(b)-2   Pr-4/Pu-4   IJP(c)/
ESD(gs)   GG
ACCESSION NR: AR4039927   S/0058/64/000/004/E081/E081

SOURCE: Ref. zh. Fiz., Abs. 4E635

AUTHORS: Anokhina, I. N.; Berzina, I. G.; Savintsev, P. A.

TITLE: Temperature coefficient of linear expansion of crystals
subjected to irradiation

CITED SOURCE: Mezhvuz. sb. tr. Zap.-Sib. sovet po koordinatsii i
planir, nauchno-issled. rabot po tekhn. i yestestv. naukam, vy*p
2, 1963, 93-95

TOPIC TAGS: alkali halide, neutron irradiation, gamma irradiation,
coefficient of thermal expansion, potassium compound

TRANSLATION: The joint action of neutron (4×10^{10} neutron/sec) and
gamma irradiation (750 roentgen) on the coefficient of linear expan-
sion (CLE) of KCl, KBr, and KI was investigated in the 100--500° in-
terval. The CLE of the irradiated crystals was found to be higher

Card   1/2

L 6907-65
ACCESSION NR: AR4039927 O

(by up to 5%) than that of non-irradiated crystals over the entire
temperature interval. For KBr the difference between the CLE of ir-
radiated and non-radiated crystals begins to decrease above 350°,
while for KI -- above 320°. This is attributed to the difference in
the binding energies in the crystals. It is shown that the CLE re-
sumes its initial value eight hours after rising as a result of irra-
diation of KCl, after which it continues to decrease reaching after
28 hours a constant value of ~96% of initial. The dependence of the
CLE of KCl on the radiation dose of protons with energies 4.5 MeV was
investigated. It is established that at 100° the CLE first drops to
the minimum at ~10^{14} proton/cm^2, after which it increases and reaches
its initial value at ~4 x 10^{14} proton/cm^2. Under the assumption that
the dependence of the dislocation density on the proton-radiation
dose is analogous in form, it is concluded that the CLE is connected
with the defect density. L. By*strov.

                        SUB CODE: SS   ENCL: 00

Card   2/2

L 6908-65   EWT(1)/EWT(m)/EPF(c)/EPF(n)-2/T/EEC(b)-2   Pr-4/Pu-4   IJP(c)/
ASD(m)-3/AFWL/ESD(gs)/ESD(t)/RAEM(t)   GG   S/0058/64/000/004/E081/E081
ACCESSION NR: AR4039926

SOURCE: Ref. zh. Fiz., Abs. 4E634

AUTHORS: Anokhina, I. N.; Savintsev, P. A.

TITLE: Annealing of alkali halide crystals irradiated by neutrons
and x rays

CITED SOURCE: Mezhvuz. sb. tr. Zap.-Sib. sovet po koordinatsii i
planir. nauchno-issled. rabot po tekhn. i yestestv. naukam, vy*p.
2, 1963, 104-107

TOPIC TAGS: alkali halide, neutron irradiation, x ray irradiation,
annealing, coefficient of thermal expansion, single crystal, potas-
sium compound

TRANSLATION: The dependence of the coefficient of linear expansion
(CLE) of KCl single crystals was investigated as a function of the

Card 1/3

L 6908-65
ACCESSION NR: AR4039926

irradiation dose with neutrons (0.5×10^{10}--14×10^{10} neutron/cm^2) and x-rays (1×10^3--8×10^3 roentgen). It is found that under neutron irradiation the CLE vs. dose curve first drops to a minimum at 0.8×10^{10} neutron/cm^2, and then rises sharply to a maximum at 3.5×10^{10} neutron/cm^2, going over into the region of positive values at 1.2×10^{10} neutron/cm^2. After going through the maximum, the curve again drops, first rapidly, and then slowly at doses $>8 \times 10^{10}$ neutron/cm^2, but remains in the positive region. In the case of exposure to x-rays, the CLE vs. dose curve first increases to a maximum at 10^3 roentgen and then decreases almost linearly in the interval up to 5×10^3 roentgen, going over into the negative region at 2.5×10^3 roentgen. When the dose increases from 5×10^3 to 8×10^3 roentgen, the CLE remains practically constant. The relaxation of the single crystals KCl and NaCl, irradiated by an RaαBe source with a dose of 4×10^{10} neutron/cm^2 and 750 roentgen reduces the CLE to the initial value after 6--8 hours. However, further exposure at room temperature leads to a decrease in the CLE compared with the

Card 2/3

L 6908-65
ACCESSION NR: AR4039926

non-irradiated sample. An increase of the relaxation temperature
to 100C greatly accelerates the recovery process. An analogous
effect is observed also in the relaxation of the crystals KBr, KI,
and KCl, exposed to x-rays. Yu. Platov.

SUB CODE: SS   ENCL: 00

Card 3/3

ACCESSION NR: AR4042157   S/0196/64/000/005/B008/B008

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 5B38

AUTHOR: Vorob'yev, A. A.; Vorob'yev, G. A.; Zavadovskaya, Ye. K.;
Savintsev, P. A.

TITLE: Some results of investigation of properties of ionic dielectrics

CITED SOURCE: Izv. Leningr. elektrotekhn. in-ta, vy*p. 51, 1963, 171-178

TOPIC TAGS: ionic dielectric, ionic crystal, lattice parameter, dielectric
property

TRANSLATION: On the basis of analysis of experimental results, a connection is
established between the physical-chemical properties of ionic crystals and alloys with
lattice energy U, lattice parameters, molecular concentration, and number of par-
ticles in a unit cell. Hardness E_{limit}, thermal and chemical stability of crystals
increases with increase of U. Properties of solid solutions are determined by
composition and defectiveness of lattice of alloys. Aging of alloys is accompanied.

Card 1/2

ACCESSION NR: AR4042157

by change of defectiveness of lattice and heat of formation Q. Number of particles
in a unit cell of hard alloys NaCl – NaBr, KCl – KBr, KCl – RbCl is less, and
temperature coefficient of expansion is more, than for pure crystals. The values
of Q, tan δ, temperature coefficient of expansion, and Debye temperature of alloys
have a maximum, while ρ and E_{limit} – a minimum in the region of average concentra-
tions of components, which is indicated by the smaller bond of ions and large
defectiveness of the lattice of alloys. Measurements of Q of hard alloys estab-
lished that eutectic alloys are not a mechanical mixture of components. The
melting point at the contact of two heterogeneous crystals is lower than the
melting point of components by tens and hundreds of degrees; there is observed
a mutual dissolution of components. The value of E_{limit} of crystals depends on
the polarity of the point, gauge of the sensor, and temperature. With a gauge
of several microns, E_{limit} increases with an increase of gauge. The experimental
results are presented which indicat the ionization character of breakdown of
crystals with the help of the mechanism of impact ionization. Two illustrations.
Bibliography: 11 references. [Tomsk Polytechnical Institute im. S. M. Kirov].

SUB CODE: EM, SS   ENCL: 00

Card 2/2

S/0000/63/000/000/0281/0287

ACCESSION NR: AT4030808

AUTHOR: Berzina, I. G.; Savintsev, P. A.

TITLE: The effect of the defectiveness of metal structures on contact fusion

SOURCE: AN UkrSSR. Institut metallokeramiki i spetsial'ny*kh splavov.
Poverkhnostny*ye yavleniya v rasplavakh i protsessakh poroshkovoy metallurgii
(surface phenomena in liquid metals and processes in powder metallurgy). Kiev,
Izd-vo, AN UkrSSR, 1963, 281-287

TOPIC TAGS: structure defect, contact fusion, crystal, radiation

ABSTRACT: In this paper the authors investigated the defectiveness of crystals at
high temperatures at which a method of contact fusion can be used for metal vapors
which have a maximum fusibility diagram. They also investigated the radiation fail-
ures in this crystal at increased temperatures which determine the velocity change
of fusion in contact with a number of other metals. The results are presented in
graphs. A diagram of the circuitry is given. The authors concluded that the
velocity of contact fusion changes with the change in the defectiveness of the
structure of the samples under radiation. The change of velocity of contact fusion
with a change of radiation dose makes it possible to judge the defects in the crys-
tals provided by the radiation. The annealing of the radiation defects occurs at

Card 1/2

ACCESSION NR: AT4030808

temperatures exceeding the temperature of contact fusion. The relaxation of the exposed crystals is accompanied by a change in the defectiveness of their structure which affects the changes in the velocity of the contact fusion. Orig. art. has: 4 figures.

ASSOCIATION: Tomskiy politekhnicheskiy institut im. S. M. Kirova (Tomsk Poly-
technic Institute)

SUBMITTED: 23Nov63   DATE ACQ: 16Apr64   ENCL: 00

                                  NO REF SOV: 013   OTHER: 006

SUB CODE: ML

Card 2/2

ACCESSION NR: AP4030368   S/0190/64/006/003/0493/0498

AUTHORS: Savitskaya, M. N.; Kholodova, Yu. D.

TITLE: Polyacrylamide and its derivatives

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 6, no. 3, 1964, 493-498

TOPIC TAGS: polymer, polyacrylamide, sulfomethylation, formaldehyde, sodium
sulfite, aminomethylation, diethanolamine, diethylamine, anionic polyelectrolyte,
cationic-anionic polyelectrolyte

ABSTRACT: The production of polyelectrolytes with anionic or cation-anionic
groups on the base of polyacrylamide (PAA) was investigated. The anionic
derivatives were obtained by reacting a 2% aqueous solution of PAA (intrinsic
viscosity of 4.6 in 10% NaCl) with 40% formaldehyde and 89.5% sodium sulfite, in
an equimolar ratio at 50-80C. A temperature of 70C for 120-150 minutes yielded a
product with a maximum content of the $-SO_3H$ ionogenic groups. The activation
energy of the process was estimated as 12.3 kcal/mole. The cation-anionic
derivative of PAA was prepared by a two-step process, the first a reaction with

Card 1/2

ACCESSION NR: AP4030368

formaldehyde, resulting in the formation of a methylol derivative of PAA. This
is followed by treatment with a secondary amine, such as diethanolamine or
diethylamine, at a pH of 10.5 and a temperature of 50-75C. Chemical analysis and
infrared spectroscopy of the polyelectrolytes showed the presence of amide,
carboxyl, methylol, sulfo- and amino groups in the polymeric chains. Orig. art.
has: 4 tables and 4 formulas.

ASSOCIATION: Institut fiziologii rasteniy AN UkrSSR (Institute of Plant Physiology
AN UkrSSR)

SUBMITTED: 18Mar63   DATE ACQ: 07May64   ENCL: 00

SUB CODE: GC   NO REF SOV: 001   OTHER: 004

Card 2/2

BERZINA, I.G.; BERMAN, I.B.; SAVINTSEV, P.A.

Microhardness of alkali halide crystals. Kristallografiia 9 no 4:
569-571 Jl-Ag '64.   (MIRA 17:11)

1. Tomskiy politekhnicheskiy institut imeni Kirova.

L 39442-65   EEC(b)-2/EWA(c)/EWT(1)/EWT(m)/EWP(b)/T/EWP(t)   Pi-4   IJP(c)   GG/
JD/JG
ACCESSION NR: AP5006052   s/0139/65/000/001/0047/0049

AUTHOR: Anokhina, I. N.; Ivankina, M. S.; Savintsev, P. A.

TITLE: Effect of irradiation on some thermal properties of alkali-halide crystals
and their solid solutions

SOURCE: IVUZ. Fizika, no. 1, 1965, 47-49

TOPIC TAGS: solid solution, alkali halide crystal, irradiation effect, linear
expansion coefficient, thermal expansion coefficient

ABSTRACT: The authors measured the temperature coefficient of linear expansion of
irradiated single crystals 0.5 KCl + 0.5 KBr. The single crystals were grown from
the melt by the Kiropoulos method. The linear expansion coefficient α was measured
with a capacitive dilatometer accurate to 10-7 deg-1. The irradiation was with an
Raα--Be source with neutron activity 4.8 x 10^6 neut/sec and γ-ray activity 10 r/min.
The results show that regardless of the length of the exposure, the temperature co-
efficient of linear expansion of irradiated crystals is smaller than that of non-
irradiated crystals. It is concluded from an analysis of the data and from a com-

Card 1/2

L 39442-65

ACCESSION NR: AP5006052

parison with the results by others that the radiation anneals the defects in the crystal at a rate that depends on the ion binding forces in the crystal lattice. Orig. art. has: 2 tables, and 3 formulas.

ASSOCIATION: Tomskiy politekhnicheskiy institut im. S. M. Kirova (Tomsk Polytechnic Institute)

SUBMITTED: 01Aug63

NR REF SOV: 006

ENCL: 00

OTHER: 003

SUB CODE: SS

Card 2/2 mb

BERZINA, I.G.; SAVINTSEV, P.A.

Mutual dissolution of the components in contact melting. Izv.
vys. ucheb. zav.; fiz. 8 no.1:73-76 '65.

Contact melting of alkali halide salts with high-melting
compounds. Ibid.:77-79   (MIRA 18:3)

1. Tomskiy politekhnicheskiy institut imeni Kirova.

ACC NR: AR6035110   SOURCE CODE: UR/0137/66/000/008/I008/I008

AUTHOR: Savintsev, P. A.; Rogov, V. I.; Dorofeyev, V. I.

TITLE: Contact melting of similar metals

SOURCE: Ref. zh. Metallurgiya, Abs. 8I56

REF SOURCE: Sb. Poverkhnostn. yavleniya v rasplavakh i voznikayushchikh iz nikh tverd. fazakh. Nal'chik, 1965, 177-179

TOPIC TAGS: melting, contact melting

ABSTRACT: The contacting of two identical metals accompanied by slow heating results in the formation of liquid films on the surface of both metals prior to reaching the melting point. The conditions of a minimum surface-energy system lead to the fusion of these films. As a result of this, the cooling of the system makes it possible to lock-weld similar samples in contact. This phenomenon is called "contact melting of identical substances." I. Tulupova. [Translation of abstract] [NT]

SUB CODE: 11/

Card 1/1   UDC: 669.017:536.421

KIR'YANOV, A.K.; PAZDNIKOV, P.A.; BABACHANOV, I.F.; DUDIN, R.N.;
    Prinimali uchastiye: BOGOMOLOV, I.Ye.; ROMANOV, G.K.;
SUKHORUKOV, Yu.P.; SAVINTSEV, P.R.

Slag depletion in tubular rotary furnaces. TSvet. met. 36 no.9:
29-32 S '63.   (MIRA 16:10)

BALZHI, M.F.; BEREZKIN, P.N.; GOL'DSHTEYN, Ya.Ye.; GAL'PERIN, Ye.B.;
        YEDLICHKO, V.V.; KERAS, A.F.; LEKUS, I.D.; POTEKUSHIN, N.V.;
        POZDNYSHEV, V.M.; SUBBOTIN, N.A.; SAVINTSEV, R.I.; TAMAROVSKIY,
        V.M.; SHEREMET'YEV, A.D.; BAKSHI, O.A., kand. tekhn. nauk,
        retsenzent; BONDIN, Ye.A., inzh., retsenzent; BOYKO, F.I., inzh.,
        retsenzent; VASIN, Yu.P., inzh., retsenzent; LAZAREV, A.A., inzh.,
        retsenzent; SOROKIN, A.I., inzh., retsenzent; KON'KOV, Arkadiy
        Sergeyevich, dots., red.; DUGINA, N.A., tekhn. red.

[Economy of metals in the machinery industry]Ekonomiia metallov
v mashinostroenii. [By]M.F.Balzhi i dr. Moskva, Mashgiz, 1962.
235 p.   (MIRA 16:2)
        (Machinery--Design and construction)
        (Metals, Substitutes for)

SICHEVOY, A.P.; MATOVSKIY, S.M.; SAVINTSEV, R.I.; MIL'MAN, Ye.A.

Transverse helical rolling and the application of round periodic sections. Kuz.-shtam.proizv. 7 no.2:11 F '65.

(MIRA 18:4)

SAVINTSEV, V. P. (Sr. Veterinarian)

"Treatment of malanders in horses."

SO: Vet. 24 (7), p. 46 1947

Sverdlov Sheep Sovkhoz

SAVINTSEV, V.P.

Therapy for gynecological diseases in cattle. Veterinariia 32
no.1:55-57 Ja '55.   (MLRA 8:2)

1.Starshiy veterinarnyy vrach Chetkarinskey MTS, Pyshminskege
rayena, Sverdlovskey eblasti.
(CATTLE—DISEASES) (VETERINARY OBSTETRICS)

L 64298-65   EWT(m)/EPF(c)/EPF(n)-2/EWP(j)/T/EWP(t)/EWP(b)   IJP(c)/RPL
EW/JD/WW/JWD/RM

ACCESSION NR: AP5020987   UR/0195/65/006/004/0732/0734   66

                                       541.17

AUTHOR: Boldyrev, V. V.; Savintsev, Yu. P.; Komarov, V. F.   60
                                                                          B

TITLE: Effect of water vapor pressure on the growth rate of nuclei in the thermal
decomposition of ammonium perchlorate

SOURCE: Kinetika i kataliz, v. 6, no. 4, 1965, 732-734

TOPIC TAGS: thermal decomposition, ammonium compound, vapor pressure,
single crystal, vaporization, nucleation, photography

ABSTRACT: Crystals of ammonium perchlorate were grown by the slow isotherm-
al evaporation of a saturated solution of ammonium perchlorate. The most per-
fect crystals, with a predominantly developed rhombic face structure, were cho-
sen under a microscope. The crystal to be investigated was placed in a thermal
chamber fastened on the stand of a MBI-3 microscope. The construction of the
chamber made possible observation and photography of the crystal, measurement
of the temperature of the crystal at the moment of dissociation, and carrying out
of the decomposition in a given gas atmosphere. Air was flowed through the
chamber at a constant rate of 6 liter/hour and the crystal was photographed at
Card 1/2

L 64298-65

ACCESSION NR: AP5020987

determined time intervals. Kinetic measurements were made by comparison of the number of nuclei and their dimensions during the course of the process. All experiments were carried out at a temperature of 230 ± 1C. Article shows photos of the crystal surface, and gives experimental data on reaction rates. It is concluded that the change in the overall rate of the thermal decomposition of ammonium perchlorate with a different content of water vapor in the surrounding atmosphere is a function of the change in the growth rate of the nuclei. Orig. art. has: 3 figures

ASSOCIATION: Institut khimicheskoy kinetiki i goreniya SO AN SSSR (Institute of Chemical Kinetics and Combustion, Siberian Branch, AN SSSR); Tomskiy gosudarstvennyy universitet im. V. V. Kuibysheva (Tomsk State University)

SUBMITTED: 21 Jul64   ENCL: 00   SUB CODE: IC, GC

NR REF SOV: 004   OTHER: 003

Card 2/2

SAVINYKH, A.G.; PETROVA, N.G.

Vacuum cooling of neutralized solution. Gidroliz. i lesokhim. prom.
11 no.3:17-19 '58.   (MIRA 11:5)

1. Khakasskiy gidroliznyy zavod
                        (Hydrolysis)   (Cooling)